§ 28.510 Definition of stability terms.

Downflooding means the entry of seawater through any opening into the hull or superstructure of an undamaged vessel due to heel, trim, or submergence of the vessel.

Downflooding angle means the static angle from the intersection of the vessel's centerline and the waterline in calm water to the first opening that cannot be closed weathertight and through which downflooding can occur.

Flush deck means a continuous weather deck located at the uppermost sheer line of the hull.

Forward perpendicular means a vertical line corresponding to the intersection of the forward side of the vessel's stem and the vessel's waterline at the vessel's deepest operating draft.

Open boat means a vessel not protected from entry of water by means of a complete deck, or by a combination of partial weather deck and superstructure which is seaworthy for the waters upon which the vessel operates.

Protected waters means sheltered waters presenting no special hazards such as most rivers, harbors, lakes, and similar waters as determined by the OCMI.

Qualified individual means an individual or an organization with formal training in and experience in matters dealing with naval architecture calculations.

Substantially altered means the vessel is physically altered in a manner that affects the vessel's stability and includes:

(1) Alterations that result in a change of the vessel's lightweight vertical center of gravity of more than 2 inches (51 millimeters), a change in the vessel's lightweight displacement of more than 3 percent, or an increase of more than 5 percent in the vessel's projected lateral area, as determined by tests or calculations;

(2) Alterations which change the vessel's underwater shape;

(3) Alterations which change a vessel's angle of downflooding; and

(4) Alterations which change a vessel's buoyant volume.

Well deck means a weather deck fitted with solid bulwarks that impede the drainage of water over the sides or an exposed recess in the weather deck extending one-half or more of the length of the vessel.

§ 28.515 Submergence test as an alternative to stability calculations.

(a) A vessel may comply with this section in lieu of the remainder of the requirements in this subpart. A certification plate installed under 33 CFR part 183, subpart B, is acceptable evidence of compliance with this section.

(b) A vessel which is fitted with inboard engines and loaded as described in paragraph (e) of this section must float in calm water, after being submerged for 18 hours, so that—

(1) For a open vessel, any portion of the vessel's gunwale is above the water's surface; or

(2) For a decked vessel, any portion of the main deck is above the water's surface.

(c) A vessel which is fitted with an outboard engine must be loaded as described in paragraph (e) of this section and must float in calm water after being submerged for 18 hours so that—

(1) The vessel has an equilibrium heel angle of less than 10°;

(2) Any portion of the vessel's hull is above the water's surface; and

(3) Any portion of the lowest 3 feet (0.91 meters) of the vessel's hull is not more than 6 inches (152 millimeters) below the water's surface as measured at the lowest point on the following—

(i) The gunwale, for an open boat; or

(ii) The main deck, for a decked vessel.

(d) A vessel which is fitted with an outboard engine must be loaded as described in paragraph (f) of this section and must survive the submergence described in paragraph (c) of this section, except that the equilibrium heel angle must not exceed 30° and the vessel must float with the lower end of the vessel not more than 12 inches (0.31 meters) below the water's surface in calm water.

(e) For the tests described in paragraphs (b) and (c) of this section, a vessel must be complete in all respects, except that machinery which would be damaged by water may be replaced with equivalent fixed weight in the same location as the machinery it replaces. The vessel must be loaded with weight to represent the most adverse

loading condition. The most adverse loading condition normally includes the maximum weight of fish in its highest possible location. Weights must be substituted for operating personnel at 165 pounds (734 Newtons) per individual and may be substituted for fishing gear. The substitute weights may be located transversely so that the vessel floats level prior to being submerged. The two largest air chambers, or compartments of a decked vessel not used as fuel tanks, that contribute buoyancy to the vessel must be flooded.

(f) For the test described in paragraph (d) of this section, a vessel must be complete and loaded as described in paragraph (e) of this section, except that the center of gravity of the equivalent maximum fish load must be located to one side of the vessel's centerline by a distance equal to one-fifth of the maximum transverse dimension of the fish storage space.

§§ 28.520—28.525 [Reserved]

§ 28.530 Stability instructions.

(a) *Intent.* The intent of this section is to ensure that vessel masters and individuals in charge of vessels are provided with enough stability information to allow them to maintain their vessel in a satisfactory stability condition. The rules provide maximum flexibility for owners and qualified individuals to determine how this information is conveyed, taking into consideration decisions by operating personnel must be made quickly and that few operating personnel in the commercial fishing industry have had specialized training in stability. Therefore, stability instructions should take into account the conditions a vessel may reasonably be expected to encounter and provide simple guidance for the operating personnel to deal with these situations.

(b) Each vessel must be provided with stability instructions which provide the master or individual in charge of the vessel with loading constraints and operating restrictions which maintain the vessel in a condition which meets the applicable stability requirements of this subpart.

(c) Stability instructions must be developed by a qualified individual.

(d) Stability instructions must be in a format easily understood by the master or individual in charge of the vessel. Units of measure, language, and rigor of calculations in the stability instructions must be consistent with the ability of the master or the individual in charge of the vessel. The format of the stability instructions may include, at the owner's discretion, any of the following:

(1) Simple loading instructions;

(2) A simple loading diagram with instructions;

(3) A stability booklet with sample calculations; or

(4) Any other appropriate format for providing stability instructions.

(e) Stability instructions must be developed based on the vessel's individual characteristics and may include the following, as appropriate for the format chosen for presentation:

(1) A general description of the vessel, including lightweight data;

(2) Instructions on the use of the information;

(3) General arrangement plans showing watertight compartments, closures, vents, downflooding angles, and allowable weights;

(4) Loading restrictions, such as diagrams, tables, descriptions or maximum KG curves;

(5) Sample loading conditions;

(6) General precautions for preventing unintentional flooding;

(7) Capacity plan or tank sounding tables showing tank and hold capacities, centers of gravity, and free surface effects;

(8) A rapid and simple means for evaluating any specific loading condition;

(9) The amount and location of fixed ballast;

(10) Any other necessary guidance for maintaining adequate stability under normal and emergency conditions;

(11) A general description of the stability criteria that are used in developing the instructions;

(12) Guidance on the use of roll limitation devices such as stabilizers; and

(13) Any other information the owner feels is important to the stability and operation of the vessel.